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$J1 = \overline{Q2}$
$K1 = Q2$

$J2 = Q1$
$K2 = \overline{Q1}$

$J3 = T \cdot \overline{Q3} \cdot Q5 \cdot R4$
$K3 = Q3 \cdot Q5 \cdot R4$

$J4 = Q3 \cdot R4$
$K4 = \overline{Q3} \cdot R4$

$J5 = (Q4 \cdot R4) + (T \cdot \overline{Q3} \cdot \overline{Q5} \cdot R4)$
$K5 = \overline{Q4} \cdot R4$

$J6 = T \cdot \overline{Q7} \cdot A$
$K6 = (Q7 \cdot A) + (T \cdot A)$

$J7 = Q6 \cdot A$
$K7 = \overline{Q6} \cdot \overline{Q8} \cdot A$

$J8 = Q7 \cdot \overline{Q6} \cdot A$
$K8 = \overline{T} \cdot A$

J9 = DECISION BAUD PULSE
$K9 = R4$

$J10 = Q9 \cdot R4$
$K10 = \overline{Q9} \cdot R4$

$J11 = (\text{START SIGNAL}) \cdot R4 \cdot \overline{Q8}$
K11 = DECISION STOP PULSE + $\overline{T}$ (800 PPS CP)

$A = (R4 \cdot \overline{Q11}) + (R4 \cdot Q3 \cdot \overline{Q4} \cdot Q5 \cdot \overline{Q6}) + (R4 \cdot Q3 \cdot \overline{Q4} \cdot Q5 \cdot \overline{Q8})$

$\text{READOUT SIGNAL} = (R2 \cdot Q6 \cdot Q8) + (R2 \cdot Q3 \cdot \overline{Q4} \cdot Q5 \cdot Q8)$

$R1 = Q1 \cdot Q2$
$R2 = \overline{Q1} \cdot Q2$
$R3 = \overline{Q1} \cdot \overline{Q2}$
$R4 = Q1 \cdot \overline{Q2}$

$ONE = (Q5 \cdot \overline{Q6} \cdot Q8) + (\overline{Q5} \cdot \overline{Q8}) + (Q10)$

$ZERO = \overline{ONE}$

$BUFFER\ 1 = (ONE \cdot R1 \cdot Q11 \cdot T) + (ONE \cdot R1 \cdot Q6 \cdot T)$
$BUFFER\ 2 = (ONE \cdot R2 \cdot Q11 \cdot T) + (ONE \cdot R2 \cdot Q6 \cdot T)$
$BUFFER\ 3 = (ONE \cdot R3 \cdot Q11 \cdot T) + (ONE \cdot R3 \cdot Q11 \cdot T)$
$BUFFER\ 4 = (ONE \cdot R4 \cdot Q11 \cdot T) + (ONE \cdot R4 \cdot Q6 \cdot T)$

$BUFFER\ 5 = (ZERO \cdot R1 \cdot Q11 \cdot T) + (ZERO \cdot R1 \cdot Q6 \cdot T)$
$BUFFER\ 6 = (ZERO \cdot R2 \cdot Q11 \cdot T) + (ZERO \cdot R2 \cdot Q6 \cdot T)$
$BUFFER\ 7 = (ZERO \cdot R3 \cdot Q11 \cdot T) + (ZERO \cdot R3 \cdot Q6 \cdot T)$
$BUFFER\ 8 = (ZERO \cdot R4 \cdot Q11 \cdot T) + (ZERO \cdot R4 \cdot Q6 \cdot T)$

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REVISIONS

EFF	SYM	AUTHORITY	DESCRIPTION	DATE	APPROVAL

TUNING FORK OSCILLATOR AND AMPLIFIER

800~

CLOCK PULSE GENERATOR — 1 MODULE

800 PPS CP

RING ONE = R1 = Q1 · Q2
RING TWO = R2 = $\overline{Q1}$ · Q2
RING THREE = R3 = $\overline{Q1}$ · $\overline{Q2}$
RING FOUR = R4 = Q1 · $\overline{Q2}$

TOTAL ESTIMATED MODULES = 3
TOTAL ESTIMATED 3 DIODE GATES = 25

ILLEGIB

$\overline{Q2}$ → J CP Q → Q1 → Q2 → K $\overline{Q}$ ← Q2

Q1: 1/2 MODULE, 1 GATE
Q2: 1/2 MODULE
RING COUNTER

T·$\overline{Q3}$·$\overline{Q5}$·R4

$\overline{Q3}$·Q5·R4 → Q3 (1/2 MODULE) → R4 → Q4 (1/2 MODULE) → R4 → Q5 (1/2 MODULE)

Q3·Q5·R4 → Q3 (1/2 MODULE) → R4 → Q4 (1/2 MODULE) → R4 → Q5 (1/2 MODULE)

Q5 = INVERSE BARKER CODE — $\overline{Q6}$·Q8

$\overline{Q5}$ = BARKER CODE — $\overline{Q8}$ — 1 GATE

BARKER COUNTER — 6 GATES

EMITTER FOLLOWER — IN BUFFER MODULE

Q10

R4·$\overline{Q11}$
R4·Q3·$\overline{Q4}$·Q5·$\overline{Q6}$
R4·Q3·$\overline{Q4}$·Q5·$\overline{Q8}$
— 2 GATES

EMITTER FOLLOWER — IN BUFFER MODULE → A = ADVANCE PROGRAMMER

800 PPS CP

B+ → INVERTER — 1/4 MODULE → $\overline{T}$

$\overline{Q7}$·A → Q6 (1/2 MODULE) → A → Q7 (1/2 MODULE) → $\overline{Q6}$·A → Q8 (1/2 MODULE)

Q7·A → Q6 (1/2 MODULE) → $\overline{Q8}$·A → Q7 (1/2 MODULE) → A → Q8 (1/2 MODULE)

PROGRAMMER — 2 GATES

A

$\overline{T}$

START SIGNAL

R4·$\overline{Q8}$·T

B−

TRANSMIT RELAY

CORE MEMORY

STOP PULSE → DECISION AND CP GEN — CP → Q11 (1/2 MODULE, 1 GATE)

BAUD PULSES → DECISION AND CP GEN — CP → Q9 (1/2 MODULE, 1 GATE) → R4 → Q10 (1/2 MODULE, 1 GATE)

Q10 = MESSAGE

R4 ← 800 PPS CP

READOUT SIGNAL ← R2·Q6·Q8
R2·Q3·$\overline{Q4}$·Q5·Q8

IN BUFFER MODULE

EMITTER FOLLOWER → INVERTER — 1/4 MODULE

R1·Q11·T
R1·Q6·T
→ BUFFER

R2·Q11·T
R2·Q6·T
→ BUFFER

R3·Q11·T
R3·Q6·T
→ BUFFER

R4·Q11·T
R4·Q6·T
→ BUFFER

11 SIGNALS — 1 MODULE

25X1

REQD	PART NO.	DESCRIPTION	ITEM

LIST OF MATERIALS

25X1

UNLESS OTHERWISE SPECIFIED			
DIMENSIONS ARE IN INCHES TOLERANCES ON 3 PLACE DEC ± .010 | 2 PLACE DEC ± .03 | ANGLES ± 0° 30'			
MATERIAL			

DRAWN
CHECKED
STRESS
APPROVED
APPROVED
APPROVED

SCALE

SECRET

NEXT ASSY	USED ON	NEXT ASSY	FINAL ASSY
APPL ATION		QTY REQD	

VELLUM "C" SIZE (GRID) FORM 25X1 REV. 8-57

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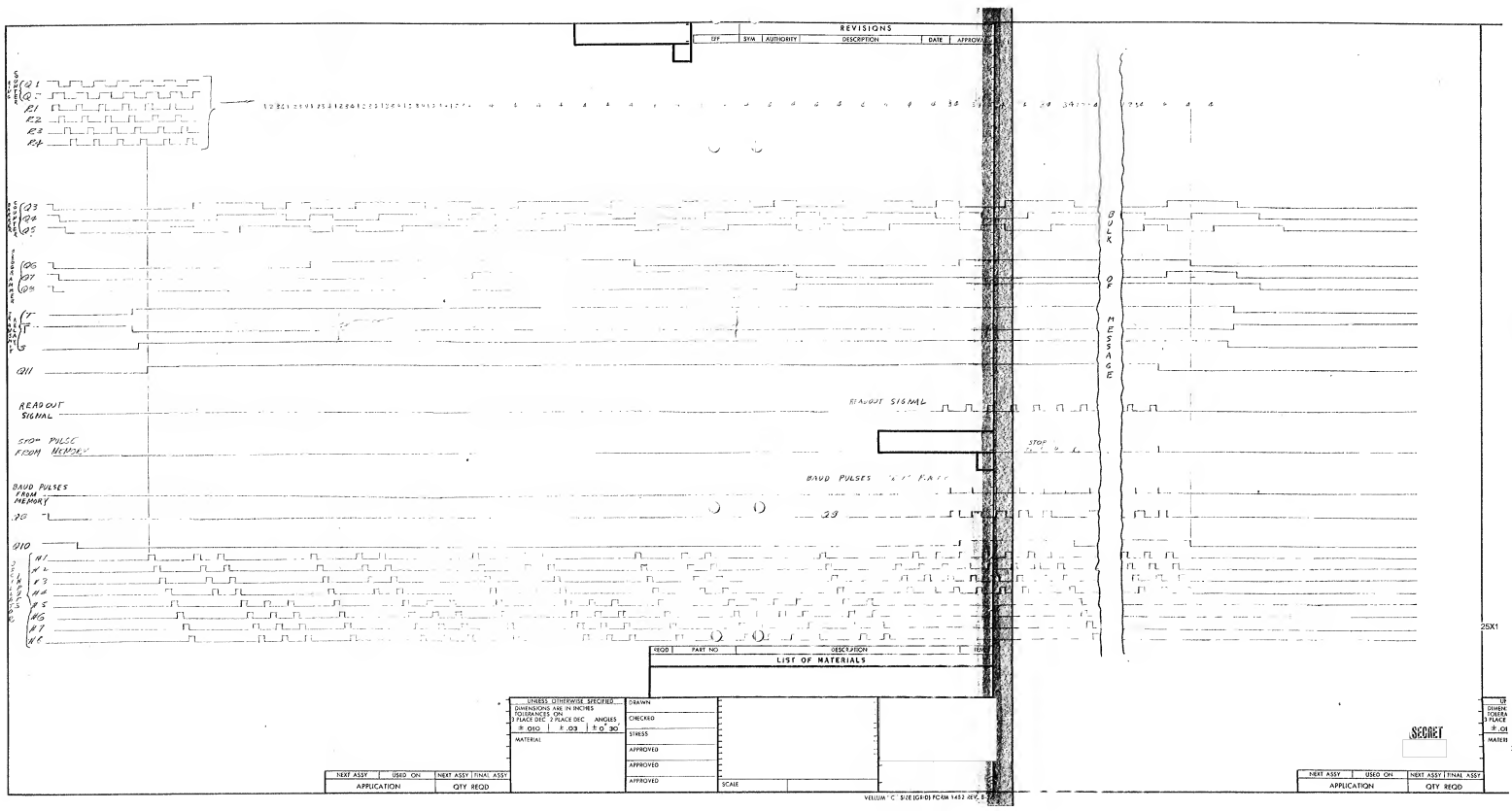

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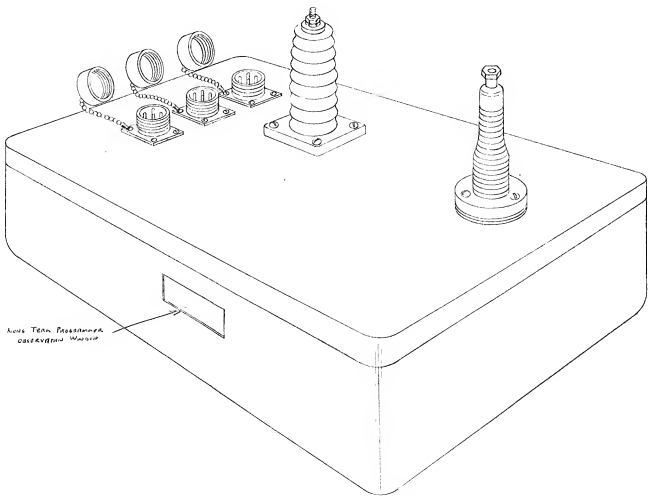

REVISIONS					
EFF	SYM	AUTHORITY	DESCRIPTION	DATE	APPROVAL

X324159

APR 16 1959

REFERENCE ONLY

Case Dimensions Not Including Antenna Mounts 15"X13"X5½"

STAT

STAT

REQD	PART NO	DESCRIPTION	ITEM

LIST OF MATERIALS

UNCLASSIFIED

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES ON 3 PLACE DEC ± .010 | 2 PLACE DEC ± .03 | ANGLES ± 0° 30'	DRAWN 15 APRIL 1958
MATERIAL	CHECKED
	STRESS
	APPROVED
	APPROVED
	APPROVED

LAYOUT
RD103 TASK 8

SCALE NONE

X324159

NEXT ASSY	USED ON	NEXT ASSY	FINAL ASSY
APPLICATION		QTY REQD	

DISTRIBUTION MUST CLEAR PATENT OFFICE

VELLUM 'D' SIZE FORM 1483 REV. 8-57

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